



# Harmful Algal Blooms in Kansas: 2021 Statistics

## Josh Cullum

## Notable Weather Events

- Drought overtook the state late in the season
  - On September 2, 87 out of 105 counties were under a drought advisory
  - Executive Order NO. 21-26
- Drought can worsen HABs by bloom concentration

## Response Plan Review: Current Advisory Thresholds

	Cell Count (cells/mL)	Microcystin (ug/L)
Watch	>80,000	>4.0
Warning	>250,000	>8.0
Hazard	>10,000,000	>2,000.0

## A Year in Numbers

### Overview Statistics

<b>Total Lakes Sampled</b>	<b>53</b>
Lakes with Advisories	48
Lakes with Warnings	32
Lakes with Watches only	16

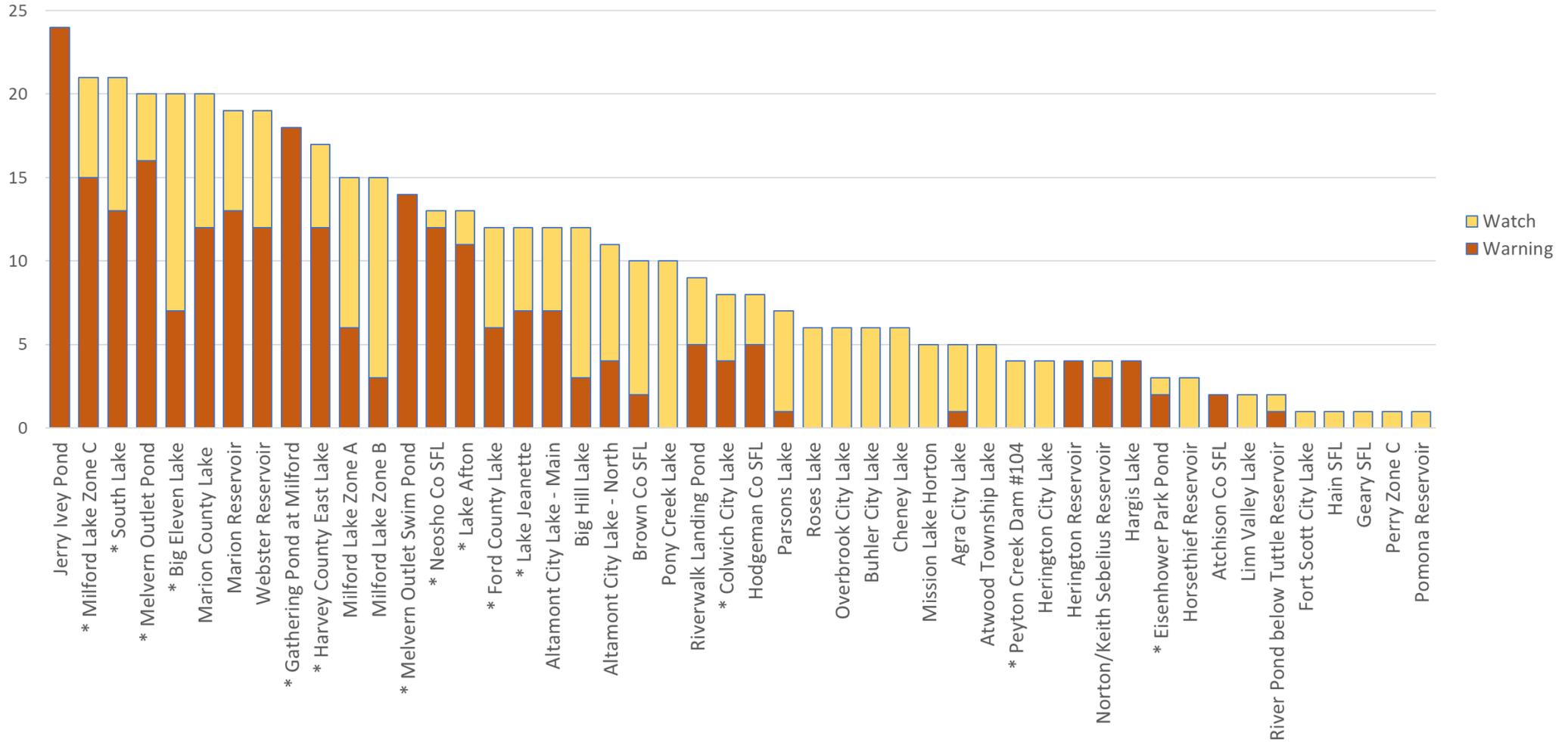
## A Year in Numbers

### Overview Statistics

<b>Total Advisory Weeks</b>	<b>456</b>
Total Watch Weeks	207
Total Warning Weeks	249
Mean Advisory Length (per Lake)	9.5

# Harmful Algal Blooms in Kansas: 2021

Weeks on Advisory: 2021 HAB Season Lakes



## A Year in Numbers

### New Lakes Added

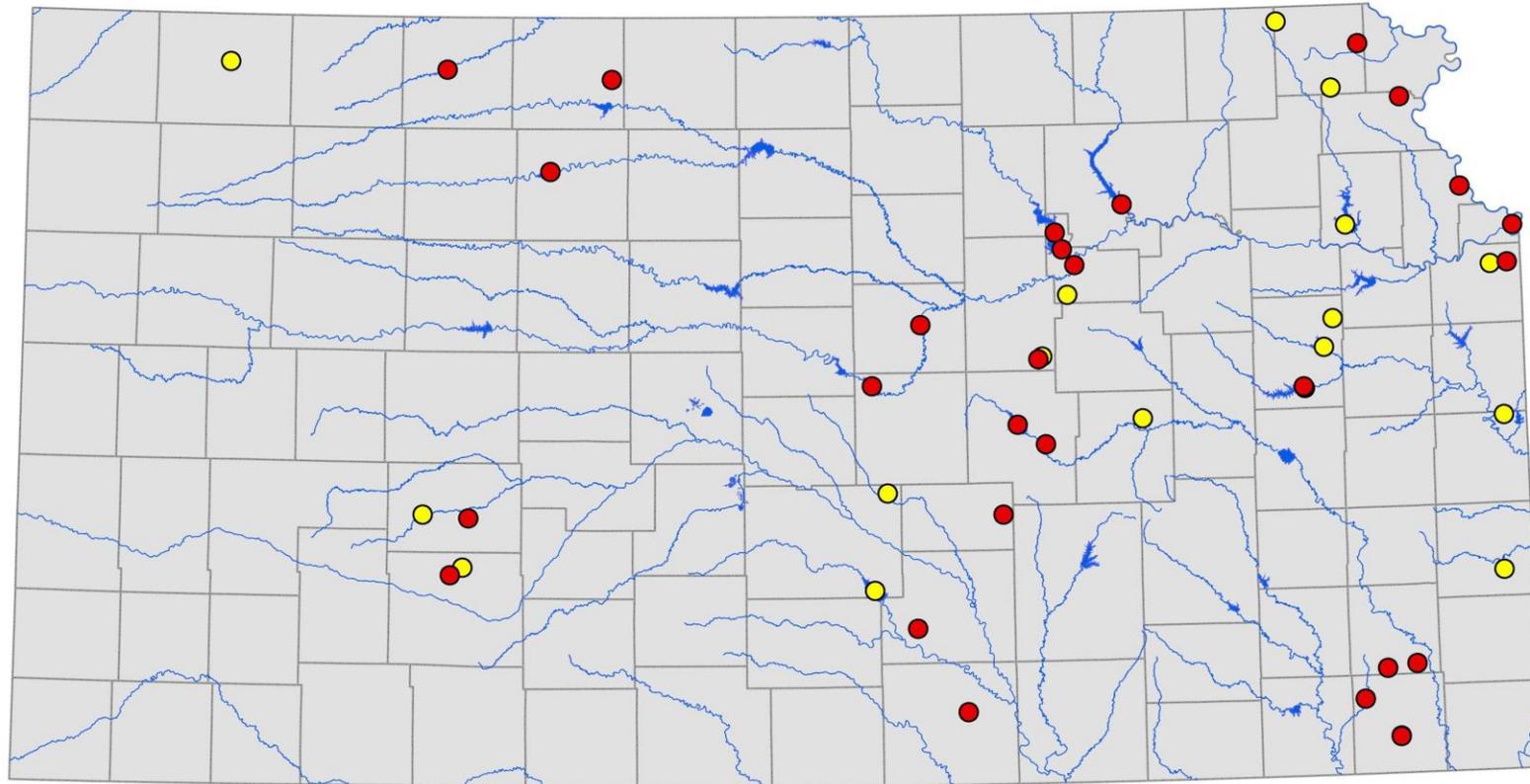
Lake Name	County	First Sample Date	Cell Count (cells/mL)	Microcystin (ug/L)	Maximum Advisory
Altamont City Lake, North	Labette	July 12	98,919	0.15	Warning
Agra Lake	Phillips	July 6	133,290	1.69	Warning
Riverwalk Landing Pond	Geary	August 13	189,440	0.15	Warning
Peyton Creek Dam #104	Chase	Visual Watch (Oct. 7)	NA	NA	Watch
Eisenhower Park Pond	McPherson	October 18	266,580	2.37	Warning

## A Year in Numbers

### Warning Level Toxin Sampled

Lake Name	Sample Date	Cell Count (cells/mL)	Microcystin (ug/L)	Weeks on Advisory
Big Eleven Lake	June 14	510,071	55.0	20
Ford County Lake	September 27	266,843	33.9	12
Marion Reservoir	June 28	625,257	69.0	19
Melvern Outlet Pond	September 20	595,344	10.8	20
Milford Lake Zone B	August 30	8,754,384	1131.0	15
Milford Lake Zone C	June 28	402,363	14.0	21
"	July 26	384,128	18.0	"
"	August 30	3,812,414	181.0	"
"	September 20	646,510	34.2	"

## Public Lakes Confirmed with Harmful Blue-Green Algae Blooms (HABs) in 2021

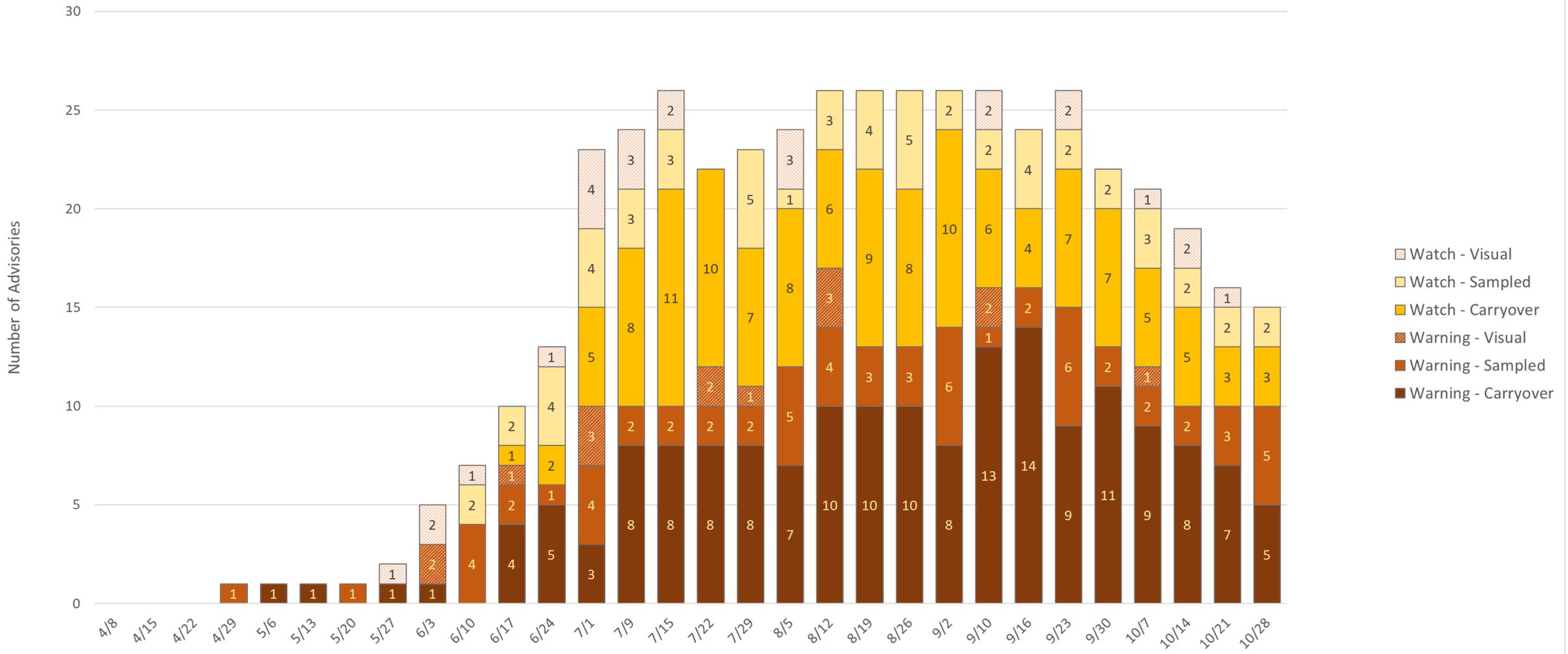


Maximum Advisory Level:      ● Watch      ● Warning

Map Credits: Katlynn Decker [KDHE]

# Harmful Algal Blooms in Kansas: 2021

HAB Advisories by Type: 2021 Season

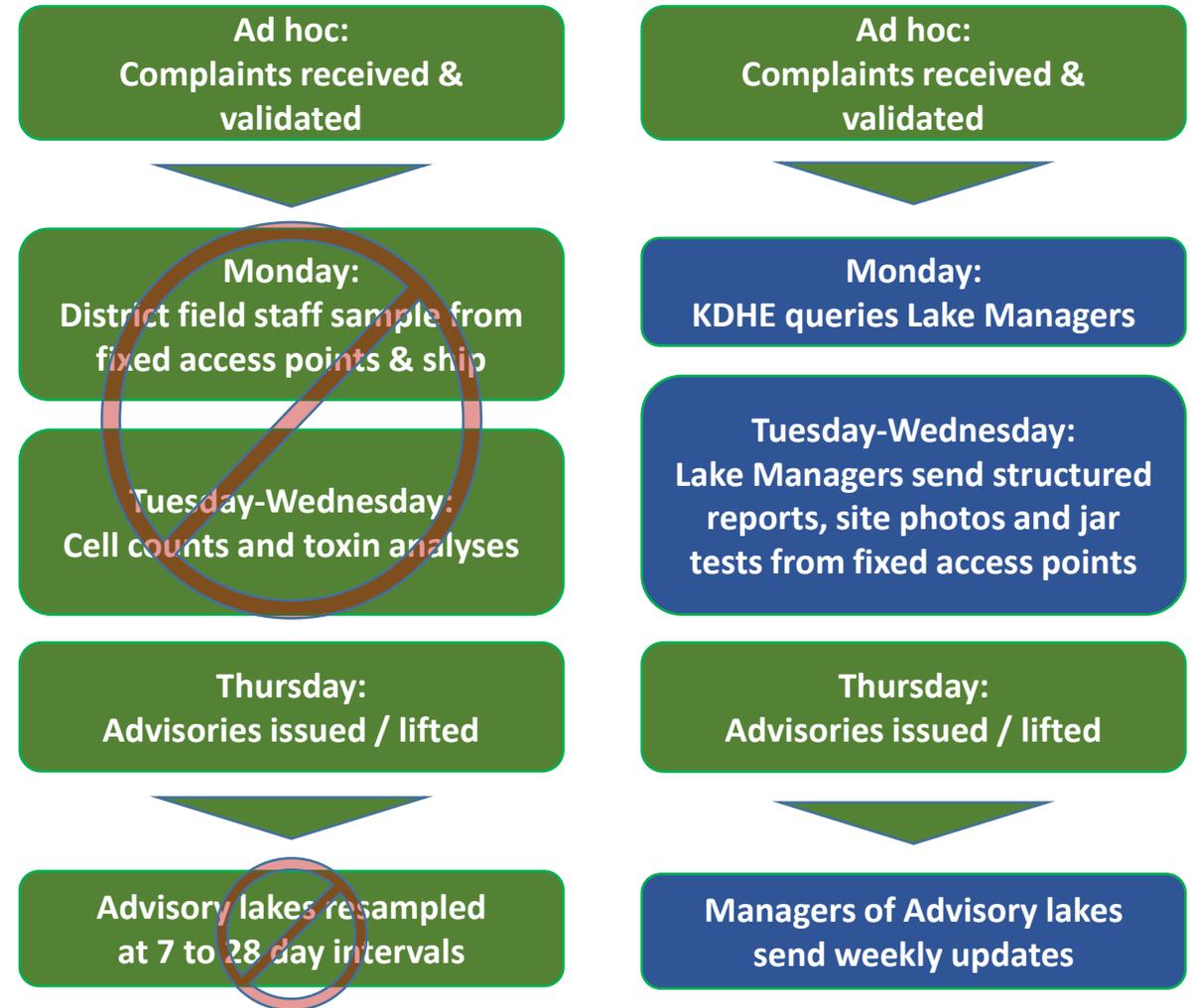


## Questions



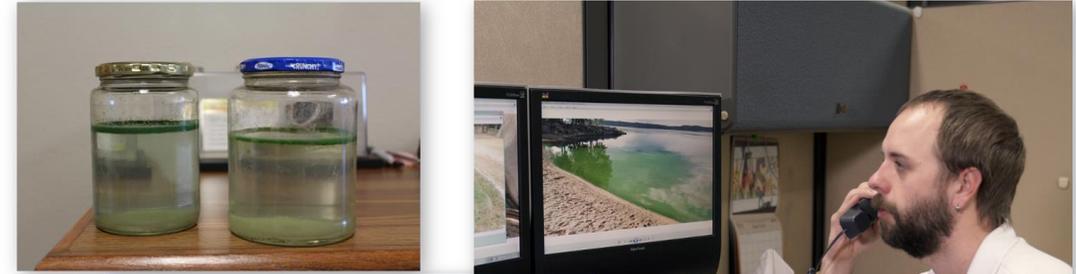
## Emergency Operations 2020

- KDHE's field and analytical capacity was severely limited by COVID-19
- Yet outdoor recreation was popular
  - Record numbers of lake visitors
- Emergency Operations Plan drafted:
  - Field **sample** data would be replaced by field **report** data



## Emergency Operations 2020

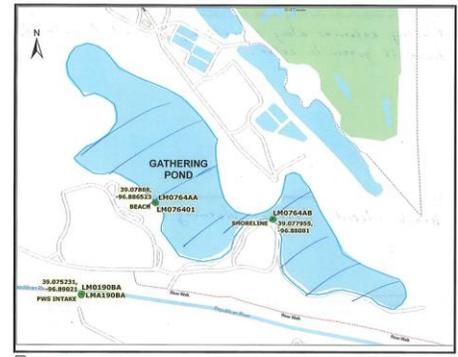
- Emergency Operations Plan implemented:
  - Weekly communication with on-site lake managers
  - Heavy reliance on structured visual data
    - Jar tests and site photos from established sample points
    - Reporting form with map provided
  - Focus on quality documentation and rule-based decision making
    - Goal: ensure consistency statewide



Describe the extent of the bloom:  
(Is the bloom prevalent throughout the entire lake, only one side of the lake, how far from the bank does the bloom extend? etc.)

*Gathering Pond BG prevalent throughout entire lake.*

2020 KDMH Harmful Algal Bloom Visual Sampling Report Form

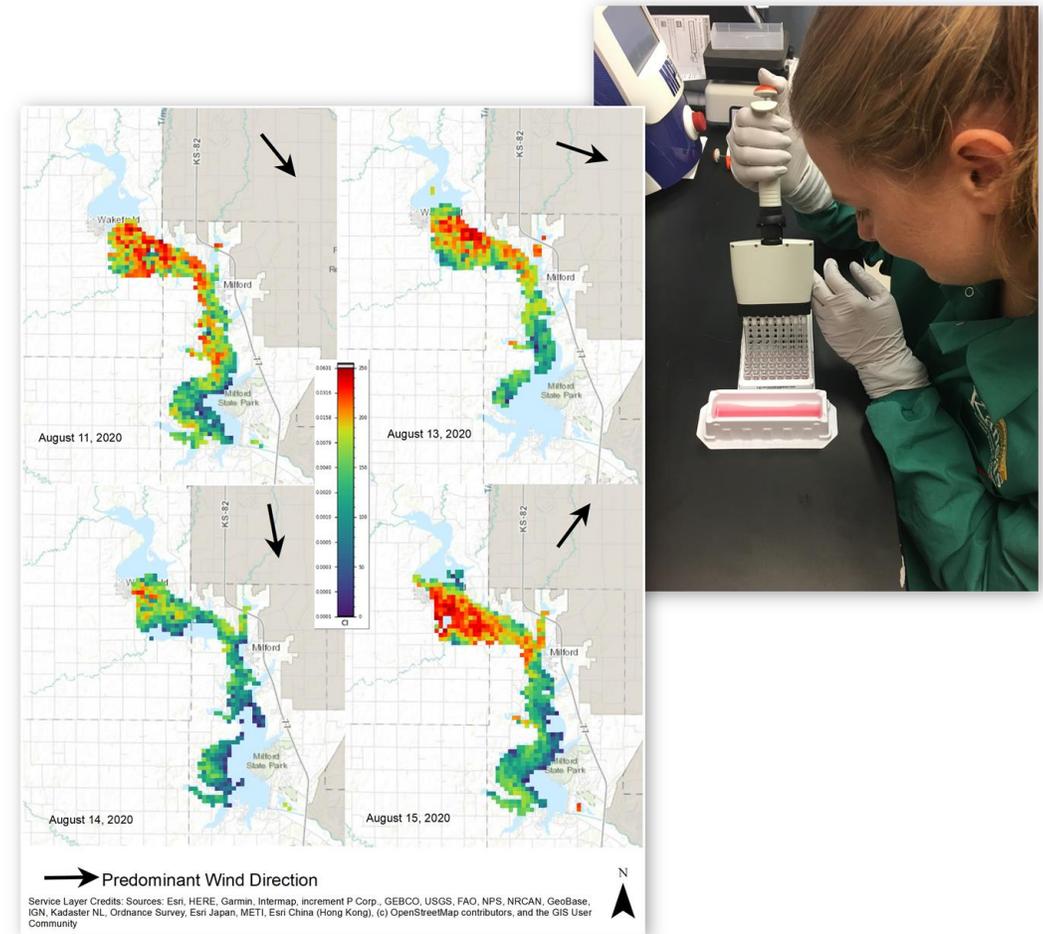
Sampling Metadata	Sampling Locations				Jer	Test	Photos	Notes
LM0754	Gathering Pond	Site	Describe	Lat	Lon			
Lake ID#	Lake Name	AA	Beach			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>8/11/20</i>	<i>12:45</i>	AB	Shoreline			<input type="checkbox"/>	<input type="checkbox"/>	
Date Collected	Time	AC	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Ken</i>		AD	N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>	
Sampler Name		Other				<input type="checkbox"/>	<input type="checkbox"/>	
		None Taken				<input type="checkbox"/>	<input type="checkbox"/>	
Describe the bloom (color/texture at each location)	Sampler Phone number							
<i>Floating Lake</i>	<i>785-238-XXXX</i>	<i>NW 3 mi, 42° .43 green last night</i>						
NOTE: When taking photos, take one "close up" of the algae and a scenic shot across the water to show the extent of the bloom. On the map, cross-hatch the areas of the lake where you can see a visible bloom, use the "highlight tool" drawing option to mark the extent of the bloom and add descriptions of the bloom's extent on second page if filling out PDF digitally.								
								
Additional notes: <i>Beach</i>								
Complete the file #								

See back of form for additional notes



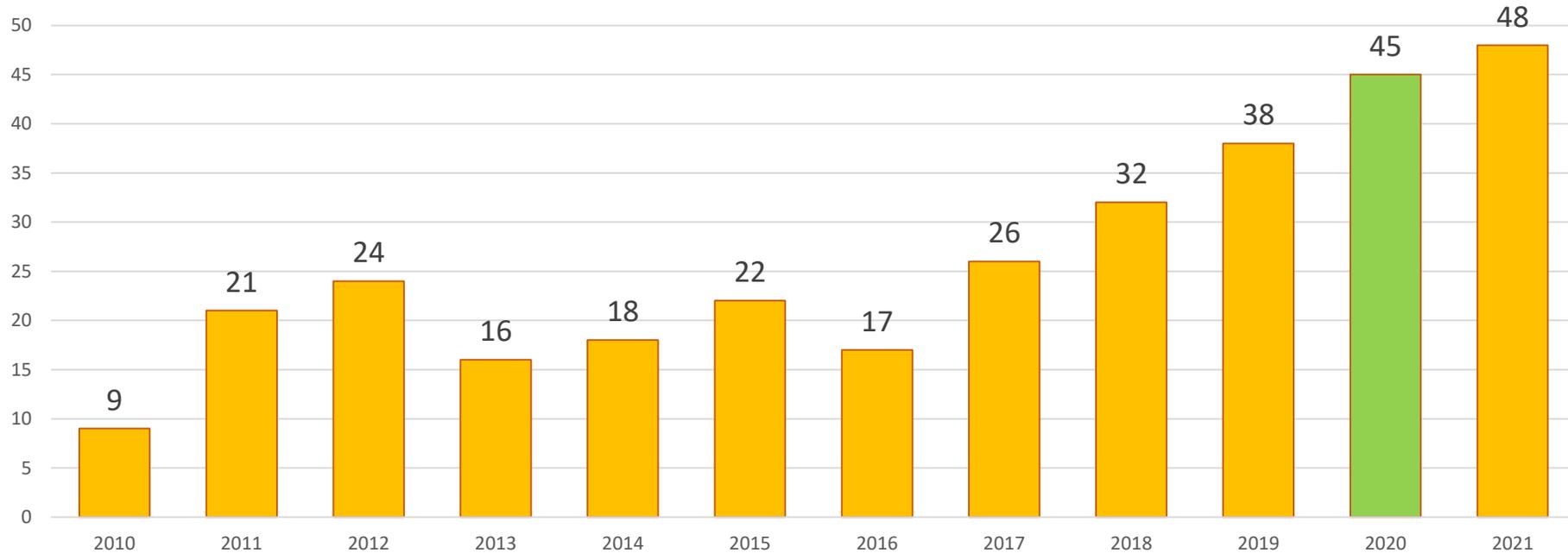
## Emergency Operations 2020

- Additional aspects:
  - Weekly check of CyAN satellite data – a “heads up” on possible conditions.
  - Occasional use of field sampling
    - Human & animal health complaints
    - Vulnerable public water supplies
    - Pre-holiday surveys
    - KHEL provided toxin analysis
    - Very rare algal ID&E



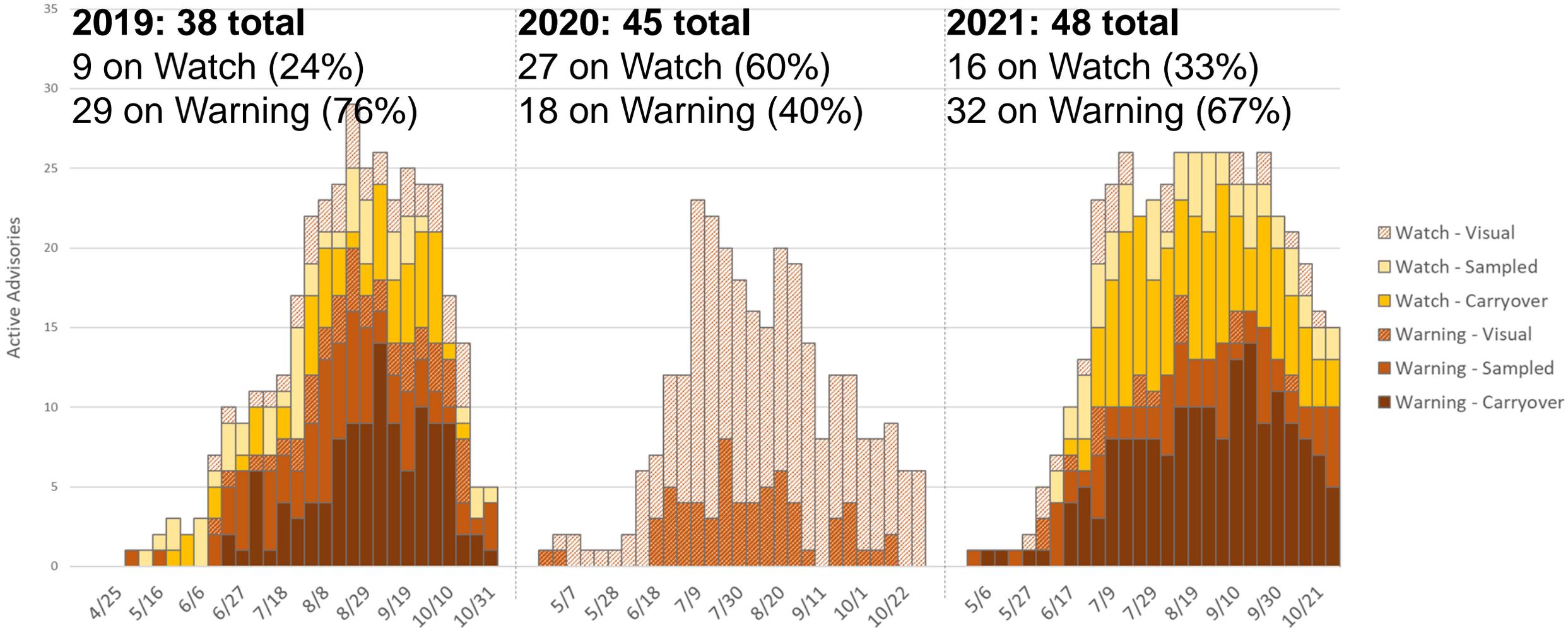
## Emergency Operations 2020: Total number of advisories was consistent with adjacent years

Kansas Public Lakes with HAB Advisories



# Harmful Algal Blooms in Kansas: 2020 and 2021

HAB Season Comparison: 2019 - 2021



## Emergency Operations 2020: Lessons

- Our calls were consistent but likely lower than what data would have supported
  - Many watches likely would have been warnings
- We still need field samples
  - Photos don't tell the whole story
  - Jar tests are qualitative, not quantitative
  - Some cyanobacteria species do not form scums
  - Toxins can occur without visible blooms
  - Local/transient conditions can also "hide" blooms
- Satellite imagery has limitations but can be useful
- Public education is critical
- Teamwork is essential!



***Only some blooms look like this.***

*An unwelcome bloom on Rose's Pond (Johnson Co.); photo by Jeff Carlson.*

## Questions





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